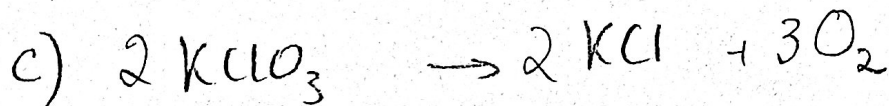
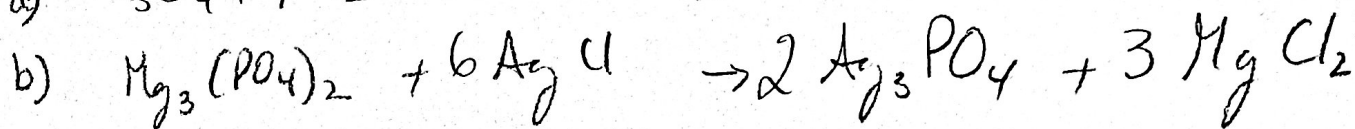
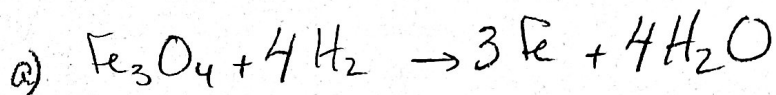


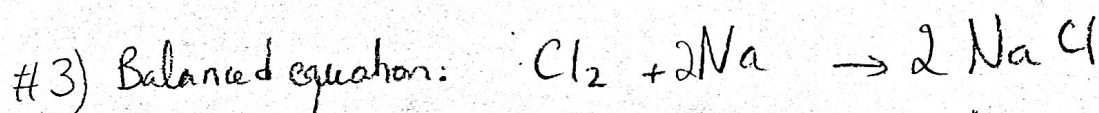
Solutions: Stoichiometry Review

#1



$$\#2 a) 12 \text{ mol O}_2 \times \frac{2 \text{ mol H}_2\text{O}}{5 \text{ mol O}_2} \times \frac{6.00 \times 10^{23} \text{ molecules H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 2.9 \times 10^{24} \text{ molecules H}_2\text{O}$$

$$b) 95 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.0 \text{ g}} \times \frac{2 \text{ mol C}_2\text{H}_2}{5 \text{ mol O}_2} \times \frac{26.04 \text{ g}}{1 \text{ mol}} = 31 \text{ g C}_2\text{H}_2$$



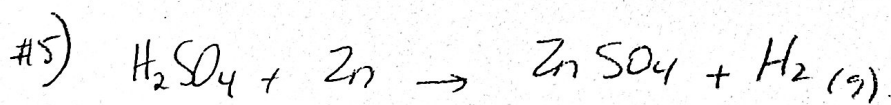
$$2.50 \text{ mol NaCl} \times \frac{1 \text{ mol Cl}_2}{2 \text{ mol NaCl}} = 1.25 \text{ mol Cl}_2$$

$$\#4) \text{STP} = 0^\circ\text{C} + 273 = 273 \text{ K}$$

and 101.3 kPa

$$100. \text{ g H}_2\text{O} \times \frac{1 \text{ mol}}{216.59 \text{ g}} \times \frac{1 \text{ mol O}_2}{2 \text{ mol H}_2\text{O}} = 0.23085 \text{ mol O}_2$$

$$V = \frac{nRT}{P} \Rightarrow V = \frac{0.23085 \times 8.314 \times 273}{101.3} = 5.17 \text{ L}$$



$$n_{\text{H}_2} = \frac{PV}{RT} \Rightarrow \frac{66.6 \times 40}{8.314 \times 283} = 1.13 \text{ mol}$$

$$1.13 \text{ mol H}_2 \times \frac{1 \text{ mol Zn}}{1 \text{ mol H}_2} \times \frac{65.39 \text{ g Zn}}{1 \text{ mol Zn}} = 74 \text{ g Zn}$$

$$\begin{aligned} \#6) \quad n_{\text{H}_2\text{SO}_4} &= C \times V \\ &= 0.30 \times 0.050 \\ &= 0.015 \text{ mol} \end{aligned}$$

$$0.015 \text{ mol H}_2\text{SO}_4 \times \frac{2 \text{ mol NaOH}}{1 \text{ mol H}_2\text{SO}_4} = 0.030 \text{ mol NaOH}$$

$$C_{\text{NaOH}} = \frac{n}{V} \Rightarrow \frac{0.030 \text{ mol}}{0.025 \text{ L}} = 1.2 \text{ mol/L}$$

$$\#7) \quad 5.00 \text{ g Zn} \times \frac{1 \text{ mol Zn}}{65.39 \text{ g Zn}} \times \frac{2 \text{ mol HCl}}{1 \text{ mol Zn}} = 0.1529 \text{ mol HCl}$$

$$\begin{aligned} V &= \frac{n}{C} \Rightarrow V_{\text{HCl}} = \frac{0.1529 \text{ mol}}{12.0 \text{ mol/L}} \\ &= 0.0127 \text{ L} \\ &\text{or } 12.7 \text{ mL} \end{aligned}$$